Host use patterns of BMSB in Oregon

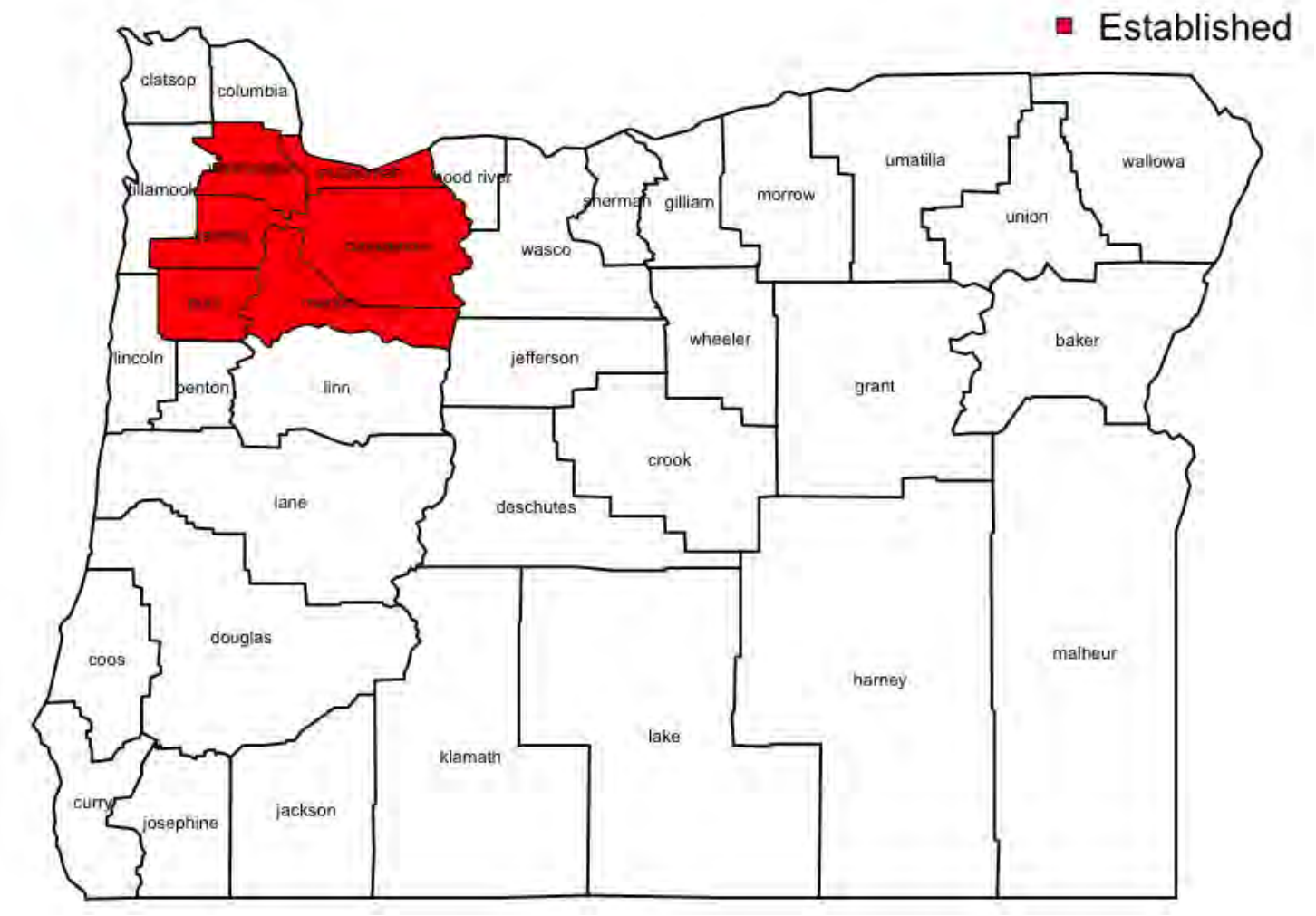
Nik Wiman, Peter Shearer, Silvia Rondon,
& Vaughn Walton

OSU
Oregon State
UNIVERSITY

Brief Background

- BMSB first found in Portland 2004
- Primarily known from urban reservoirs
- Distribution based on reporting to ODA
- Sporadic reports from outside the known distribution…
- No real host use information
  - Most reports originate from diapause behavior

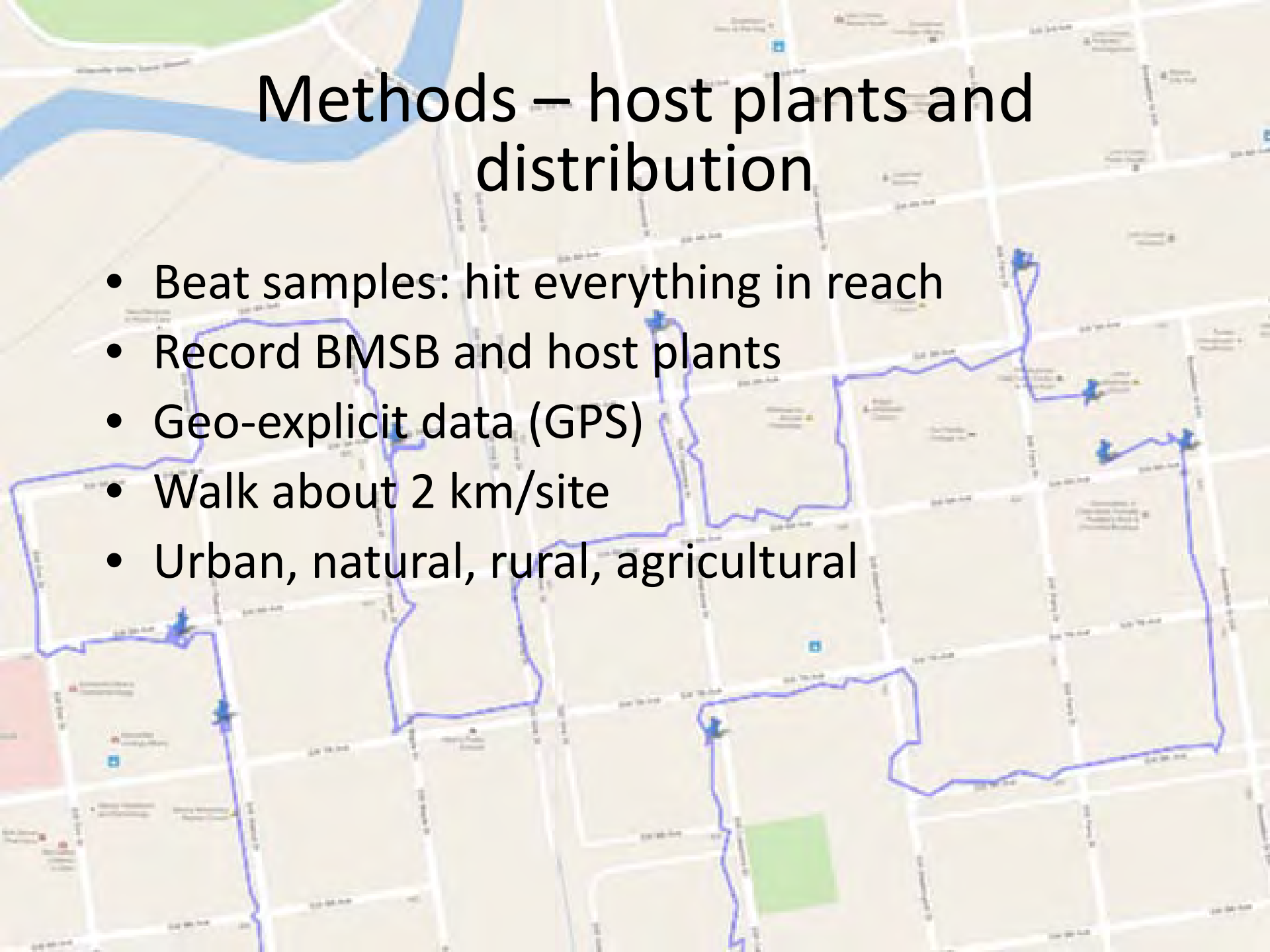
Distribution of BMSB – 2011



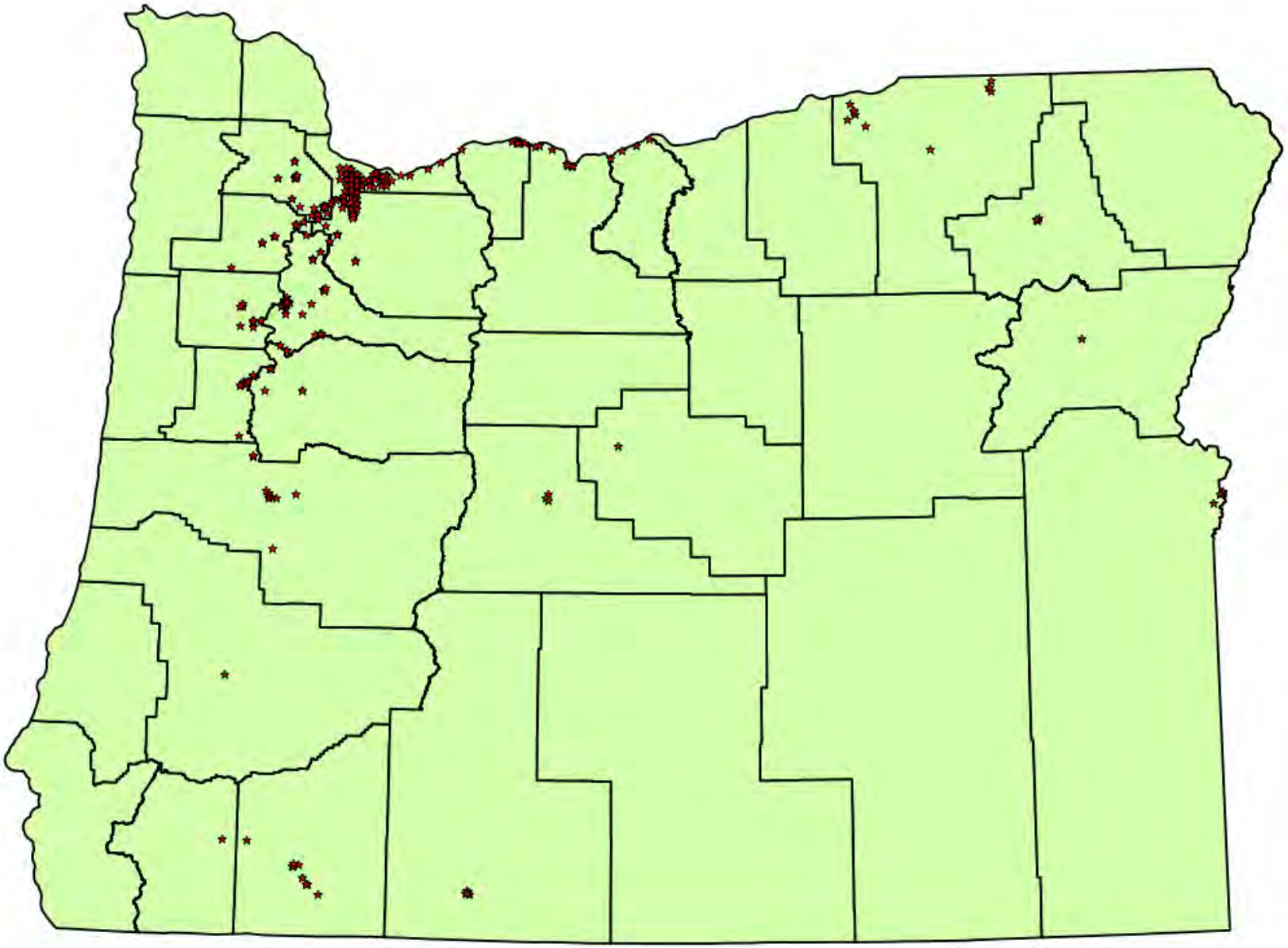
NAPIS (National Ag Pest Information System http://pest.ceris.purdue.edu/

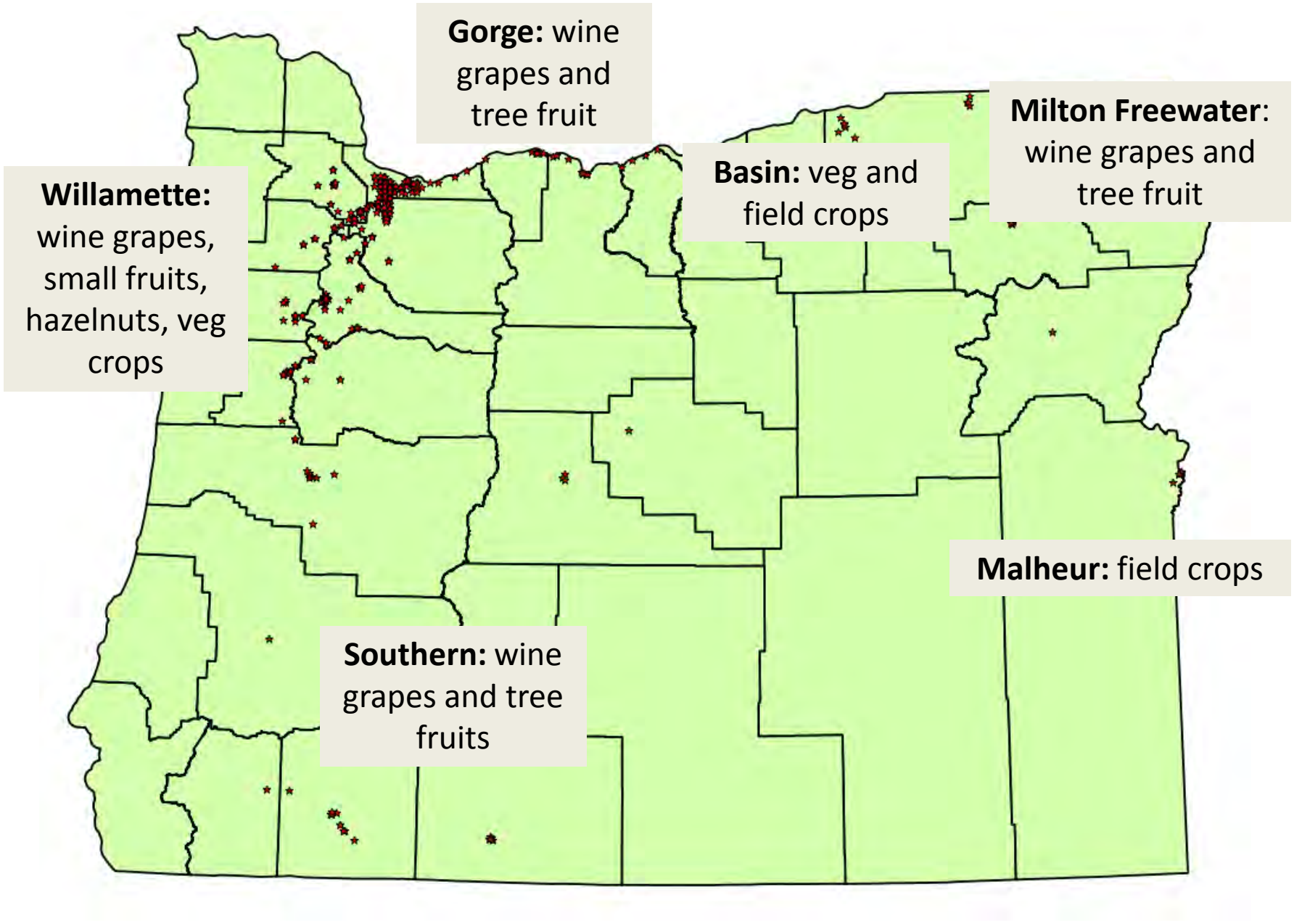
Methods – host plants and distribution

- Beat samples: hit everything in reach
- Record BMSB and host plants
- Geo-explicit data (GPS)
- Walk about 2 km/site
- Urban, natural, rural, agricultural

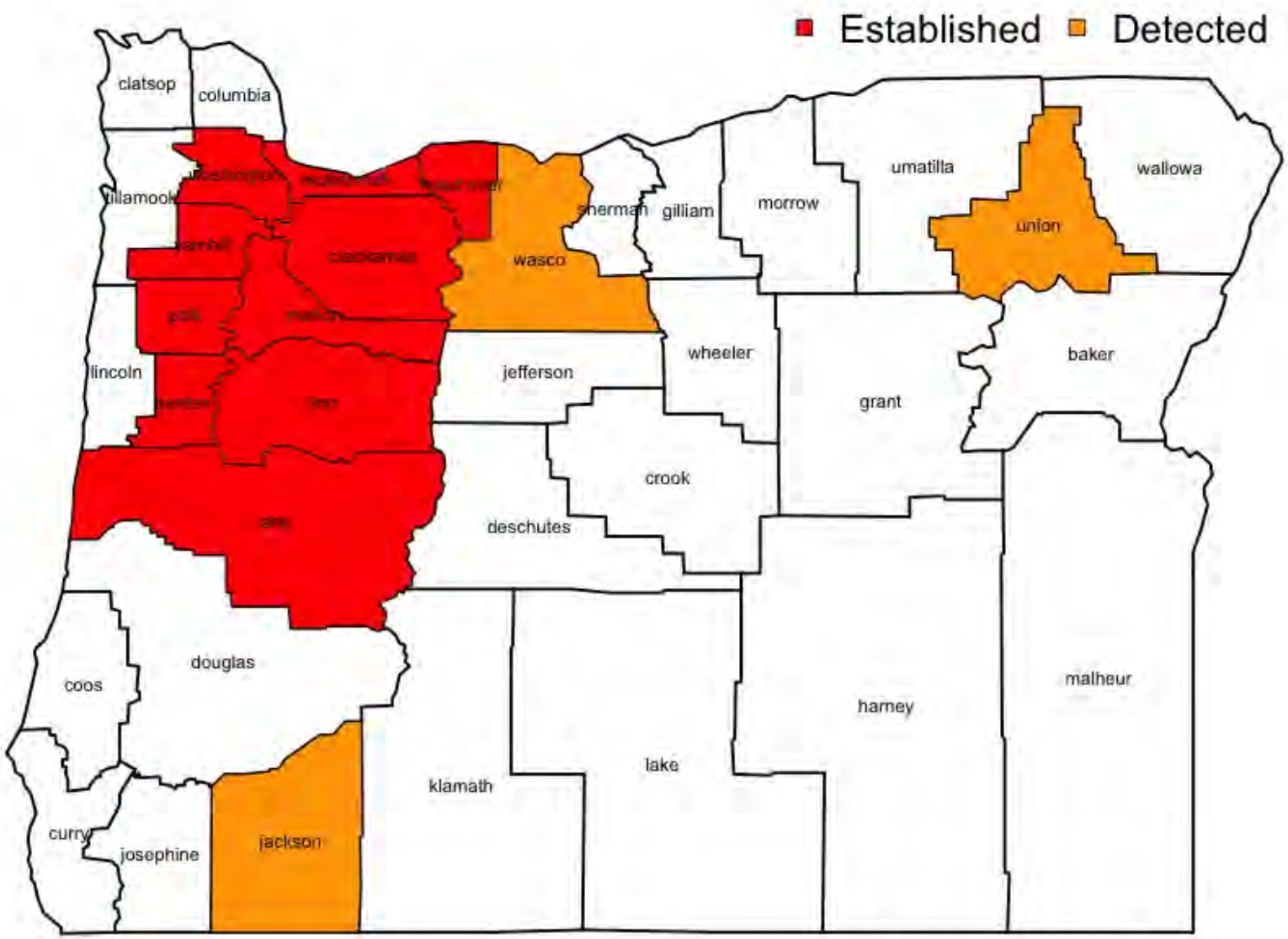


Surveys BMSB Sampling 2012




Gorge: wine grapes and tree fruit
Milton Freewater: wine grapes and tree fruit
Basin: veg and field crops
Willamette: wine grapes, small fruits, hazelnuts, veg crops
Malheur: field crops
Southern: wine grapes and tree fruits

Co. Distribution of BMSB – 2012



2012 Survey for Brown Marmorated Stink Bug (*Halyomorpha halys*), Oregon State University

Relative Density of BMSB

- **Metrics of density**
  - **Problem:** how to integrate sample data from diverse environments into a relative format that is representative of BMSB density

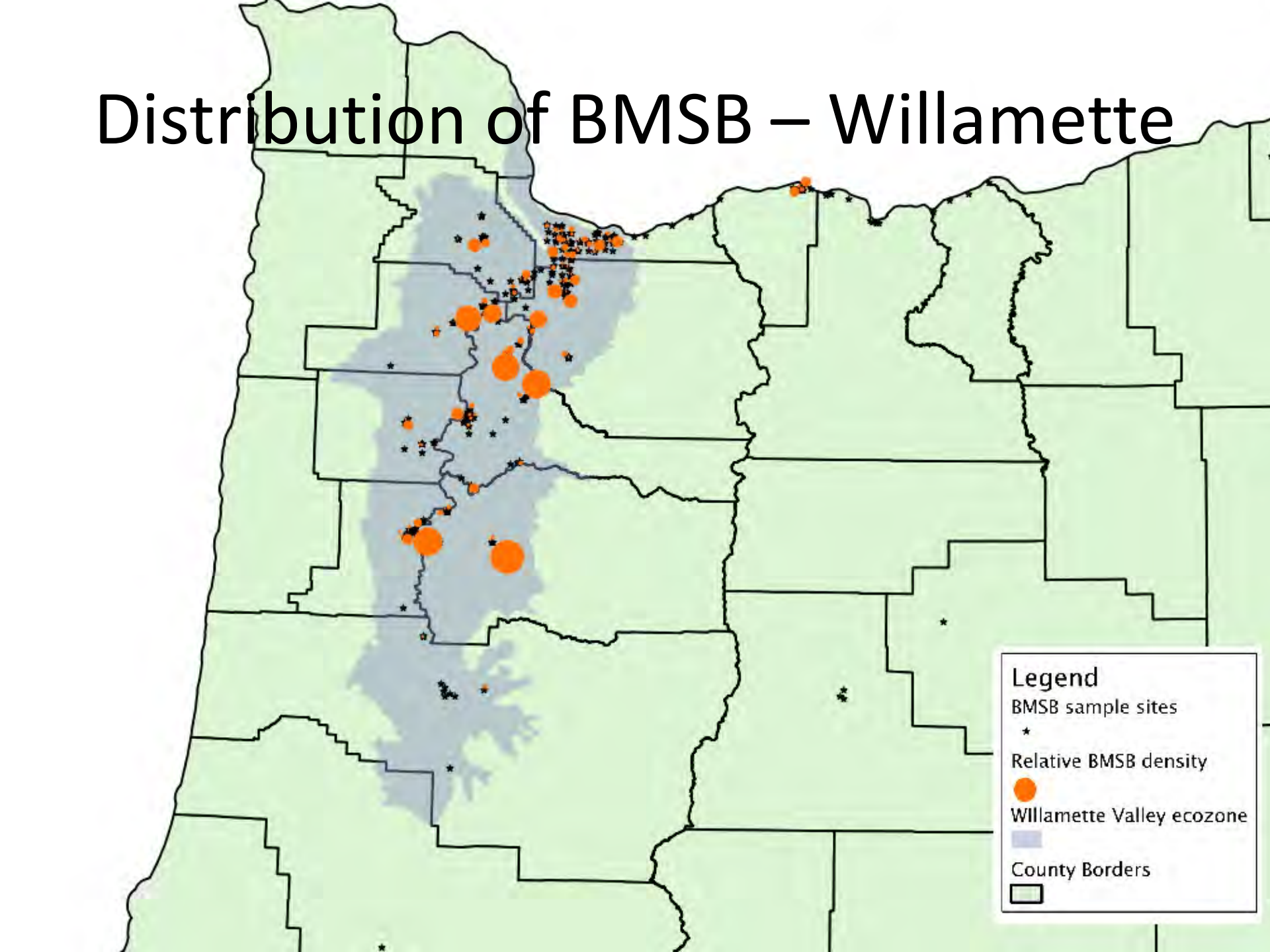
A simplistic method for now:

Total sample time – total moving time = Beating time
(assumes that when not moving, taking beat samples)

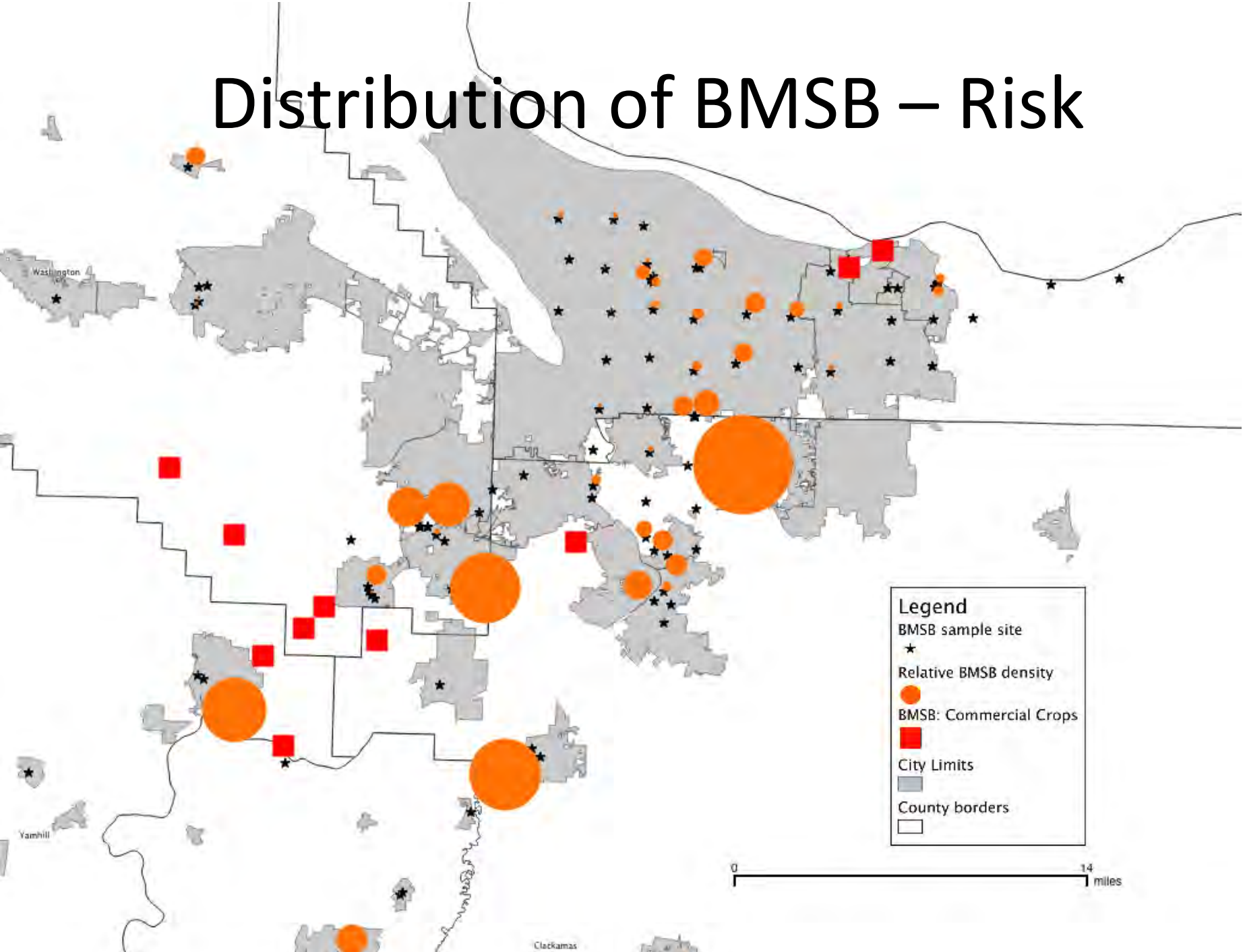
No. BMSB/Beating Time = Relative density
(a measure of bugs encountered/unit time)

Problem: dispersion (sampled plants and BMSB populations)

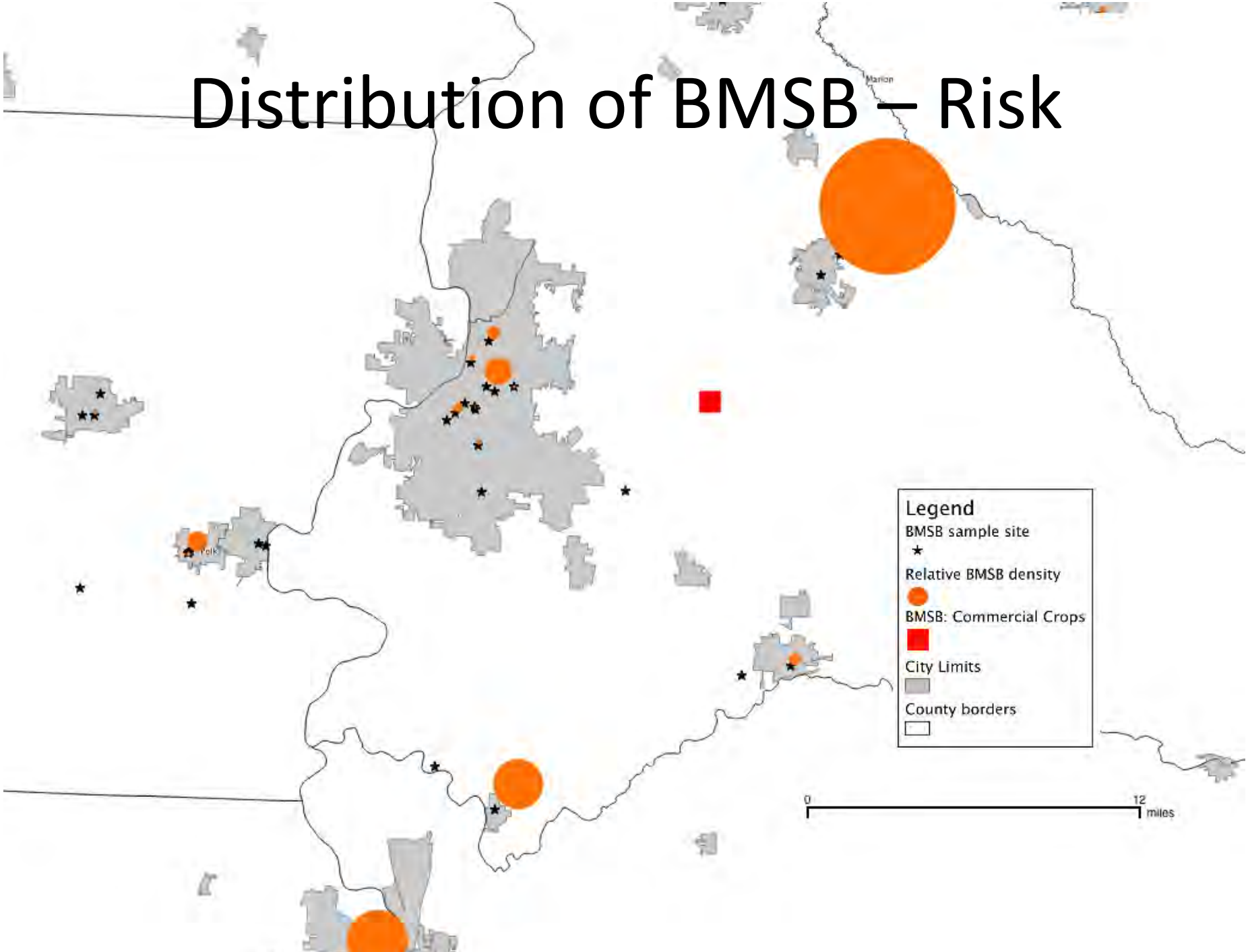
Distribution of BMSB – Willamette



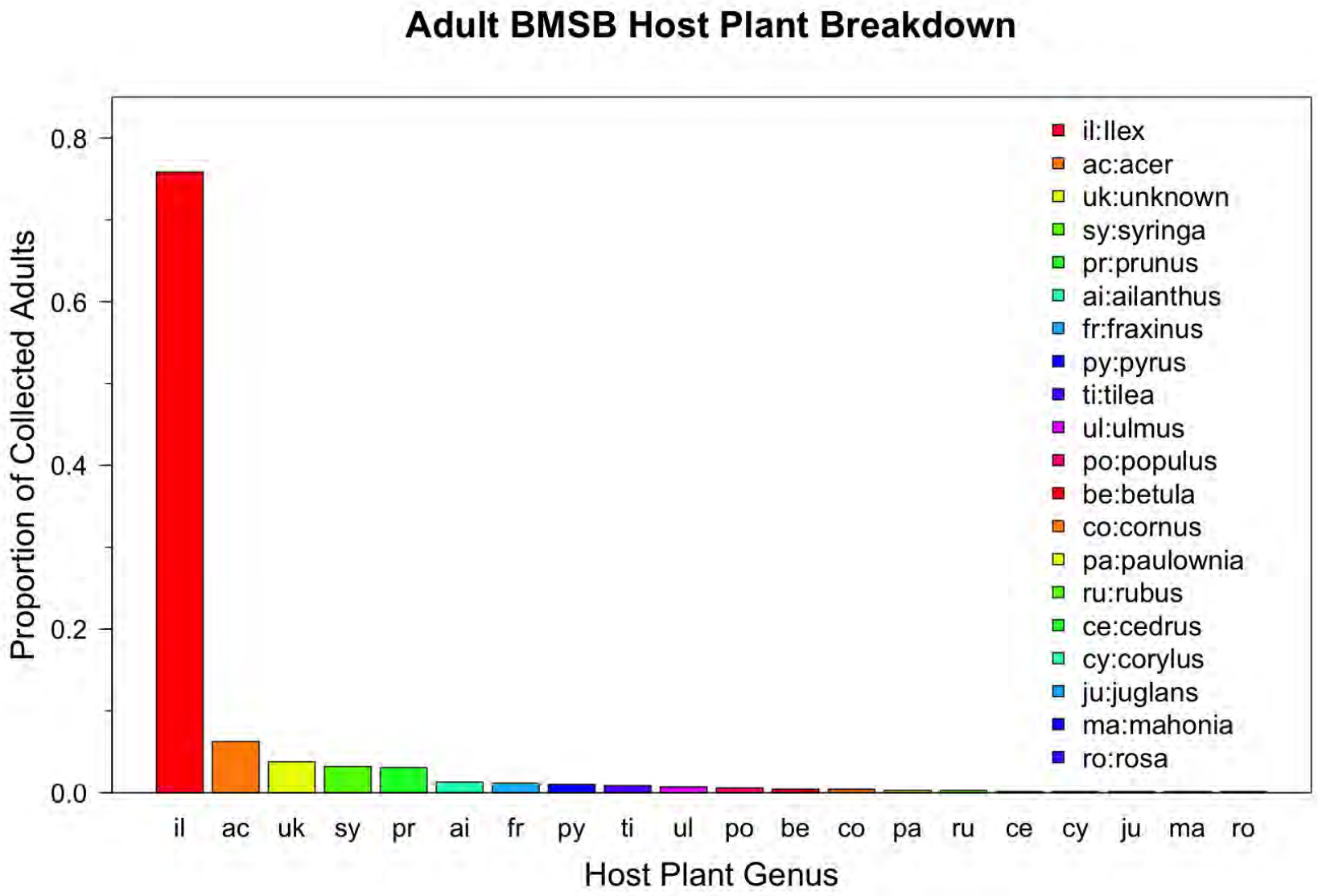
Distribution of BMSB – Risk



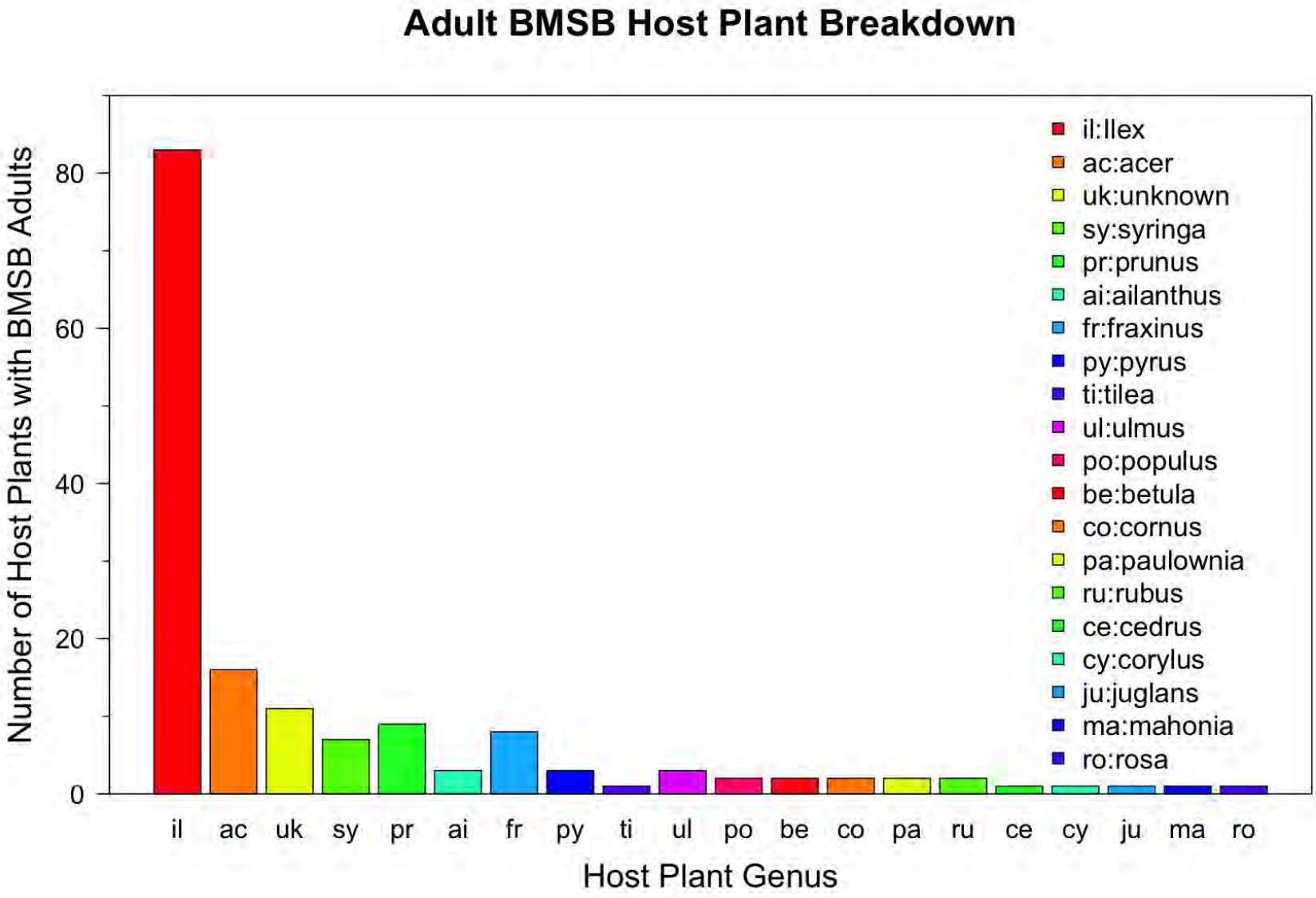
Distribution of BMSB – Risk



Host use patterns – proportions



Host use patterns – by plant



English Holly – *Ilex aquifolium* L.

- First imported to OR in 1869
  - It flourished
  - Some originals still living
- (1986) 1800 acres in PNW
- $2 Million industry
  - Cuttings Nov.-Dec
- Biggest plantings were around PDX
  - Urbanization: many orchards removed
  - Many trees were saved
    - Now in neighborhoods

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Dr. R. L. Ticknor
Professor of Horticulture
OSU
North Willamette Experiment Station
15210 NE Miley Road
Aurora, OR 97002

OVERVIEW OF COMMERCIAL PRODUCTION OF CUT ENGLISH HOLLY (ILEX AQUIFOLIUM) IN THE PACIFIC NORTHWEST

English holly, *Ilex aquifolium*, has been used for Christmas decoration in England and Europe for centuries and was used in Roman celebrations even earlier. *Ilex aquifolium* is native to England, France, Germany, southern Europe, northern Africa, and Asia.

Introduction of English Holly to the Northwest

Date of the first introduction of seeds or plants into the Northwest is not known, but a shipment of plants from Europe was received in 1869. Proof of the suitability of the Pacific Northwest climate for this plant is its naturalization in woodlands and hardens in the region. One of the earliest dated English holly trees in the Northwest is the tree planted on the grounds of the Pioneer Court House in 1874 which is still flourishing beside the Transit Mall in downtown Portland.

Dating from 1874, this massive English holly has been a landmark on the site of the Pioneer Post Office in Downtown Portland, Oregon. The trunk of this great holly measures approximately three feet in diameter and eight feet in circumference and soars to fifty feet in height.

Commercial Production of Cut Holly

Interest in holly as a crop in the Northwest started in the 1890's with shipments of cut branches from landscapes and small plantings to California. Initially holly was cut from trees and hedge plantings in yards. Then in 1891 forty trees were planted as an orchard at the Meeker place in Puyallup, Washington; the first holly was cut for sale from them in 1898.

Production Statistics

http://horticulture.oregonstate.edu/system/files/onn100112.pdf

English Holly – *Ilex aquifolium* L.

Regarded as an invasive plant by USDA

Plants.USDA.gov

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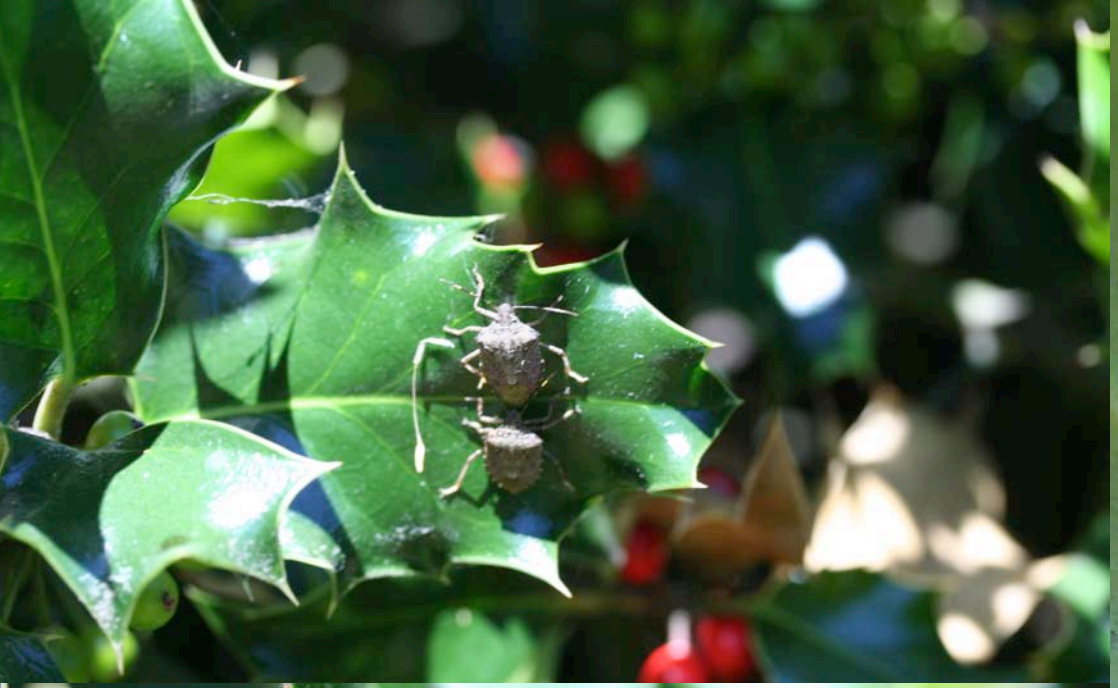
Invasive Hollies (*Ilex*, Aquifoliaceae) and Their Dispersers in the Pacific Northwest

Peter F. Zika

University of Washington Herbarium, Box 355325, Seattle, WA 98195-5325 Zikap@comcast.net



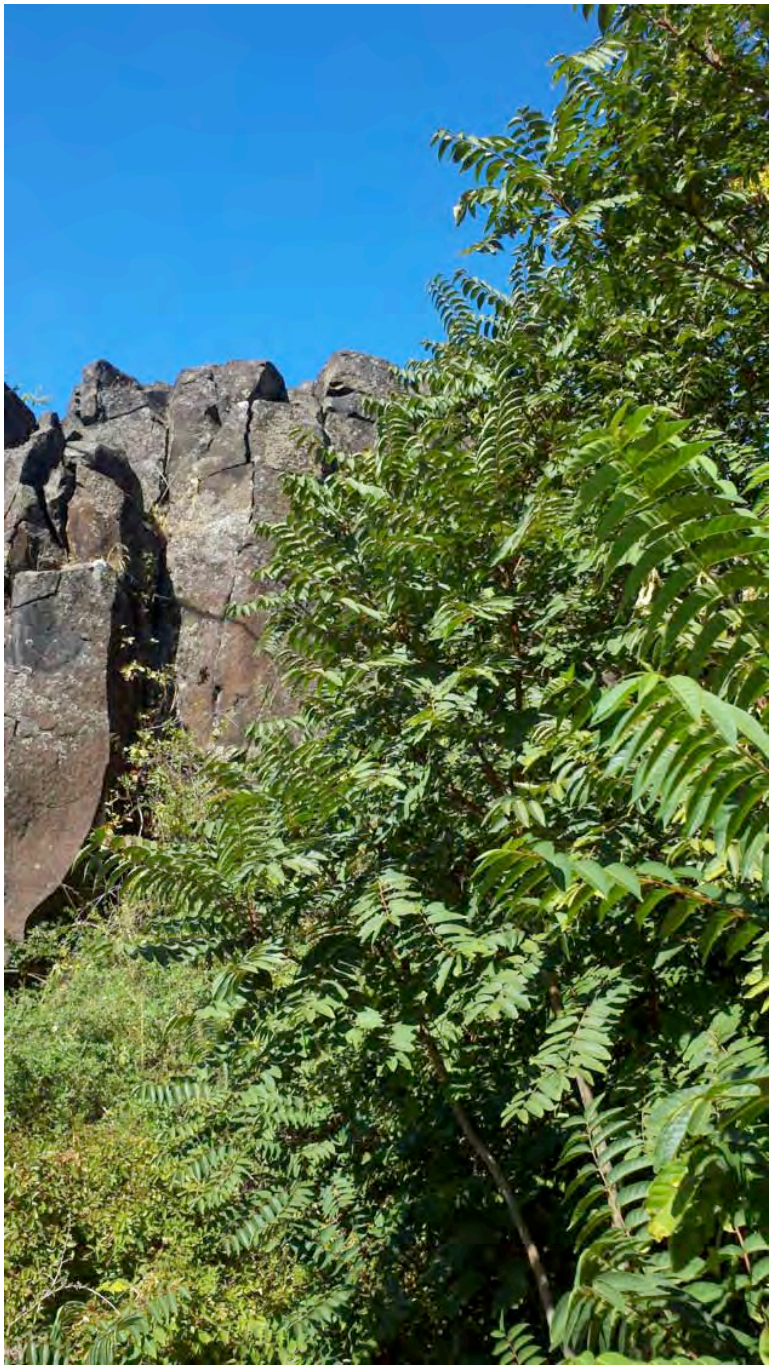
English Holly – *Ilex aquifolium* L.

Variegated varietal

Conclusions – Holly Attributes

- What makes holly an ideal BMSB host plant?
  - Berries are on all year (females)
    - Male plants not attractive
  - Berries are abundant
    - Huge BMSB populations
  - Dense foliage with spiny defense
  - Slow decomposition of leaves
    - Lots of duff/leaf litter
      - Aggregation sites?
    - Depends on cultivation
- Use as an indicator/trap crop
  - Attraction vs. survival

Other important hosts

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